

pupate but pass the winter as larvæ. One notable exception to this rule occurred in Kansas in 1910. Here records taken for the Kansas Station by Mr. Hillis at Parker show considerable moth emergence up to the tenth of September. In this case these were thought to be only belated individuals of the second brood but some of them may have been third brood moths.

The band records above show a normal first brood with the second brood larvæ appearing about August first and continuing until picking time. The remarkable feature of these records is the pupation. In place of stopping with the first brood larvæ it continued until the very last collection of larvæ.

In the orchards during picking time moths were abundant and eggs on foliage and fruit were more plentiful than at any previous time. It was not unusual at this time to find five or six eggs on a single apple, and almost no apples were free of eggs. From September 10th to picking time 50 per cent more damage was done than in the entire season previously. Young larvæ began to be numerous about September 15th, and were increasingly so up to the time all the apples had been picked. On October 18th, of four hundred apples showing moth injury, 320 had young larvæ present in the fruits, and many of the apples had more than one. Over ninety per cent of these larvæ were less than three eighths of an inch in length and certainly were not more than fifteen days old.

The first frost of the season occurred on October 19th and as most of the apples were harvested at this time, it is probable that many of the late larvæ failed to survive. It will be interesting to watch developments in the same orchards next season.

While the foregoing notes do not prove absolutely the presence of a third brood, it does show a very unusual state of affairs which can best be explained by the assumption that there was a third brood and that it was, perhaps, induced by the very unusual weather conditions. It is unfortunate that arrangements were not made to observe certain individuals and their progeny throughout the season so that we would have irrefutable evidence, but since this was not done the observations recorded may prove of interest to some.

INSECTS OF THE YEAR 1911 IN MASSACHUSETTS

By H. T. FERNALD, *Amherst, Mass.*

No unusual destruction by insects has been observed in Massachusetts during the year which has just closed. On the other hand, many different kinds have contributed toward the loss which has

been experienced and several not usually met with have been in evidence.

The unusually hot, dry summer was of course, favorable to the rapid increase of plant lice and the San José scale. Cutworms were also very abundant and did much damage, and the elm-leaf beetle was unusually destructive, though in most towns this pest is now quite well kept in check by spraying. It was first found in Nantucket this summer in small numbers, on five or six elms near the center of the town, not as perhaps might have been expected, on the trees nearest the wharves.

The leopard moth, *Zeuzera pyrina* L., is now present almost everywhere in eastern Massachusetts near the coast, and has even reached Nantucket. It does not seem to have worked its way far inland, however, and as in other states, its injuries are most pronounced in the cities and larger towns.

The twelve-spotted asparagus beetle, *Crioceris 12-punctata* L., which has been working its way northward, was taken at Concord and Roslindale near Boston in 1909. It was not observed at Amherst until last summer, which might indicate a more rapid dispersal along the coast than inward.

The cottony maple scale, *Pulvinaria innumerabilis* Rathv., has been unusually abundant in the Connecticut Valley this year, many of the soft maples being so thoroughly covered with it as to have made little or no growth. This is the first time for several years that this insect has attracted any attention in the state.

In 1910 the white birches throughout New England were attacked by the birch-leaf skeletonizer, *Bucculatrix canadensisella* Chamb., and almost without exception, the leaf tissues were entirely consumed. As scrub birch is so abundant everywhere in this part of the country, much attention was directed to this insect and many inquiries as to the likelihood of the destruction of the trees were received. During the past fall the insect was again in evidence, but to a less degree, only a small portion of the foliage being destroyed, and as a whole, the greatest injury appears to have been in localities where the pest was least abundant last year.

The cutleaved birches so much favored as ornamental trees have had a different experience. They have suffered equally with the native varieties, but in addition, for the last three years in the Connecticut Valley at least, they have also been attacked by the bronze birch borer, *Agrilus anxius* Gory, and in nearly every case where this insect has entered a tree, its death has followed, while the native birches have thus far appeared to be exempt.

The latter part of May some large chestnut trees in Amherst were

reported as dying. An examination showed that they had been nearly girdled, close to the ground, and full grown larvæ, pupæ and adults of *Leptura zebra* Oliv. were found in the burrows.

For several years the elm-leaf miner, *Kaliosysphinga ulmi* Sund., has been present in considerable abundance. Last year this insect was less noticeable than in 1909, but during the past summer its work on Camperdown and European elms has been very noticeable. In many cases the parenchyma of all the leaves of the trees has been almost entirely consumed and the trees have made little or no growth.

Some facts which have been noted would seem to indicate that there are two generations a year of this sawfly in Massachusetts.

The work of the maple-leaf stem sawfly, *Priophorus acericaulis* MacGill., was quite noticeable in some parts of the state last spring. It had previously been noticed but has evidently become much more abundant during the last year or two.

A specimen of the roach, *Panchlora hyalina* Sauss., was taken near Amherst in a field at least half a mile from the nearest store. It is of course, to be presumed that it came in on some tropical fruit, but it is evidently liable to fly some distance, and may therefore be met with almost anywhere.

During June the members of an elementary class in Entomology at the college, interested in collecting insects, obtained a trolley car headlight with the requisite apparatus, and took it to a point where the local car line passes through a densely wooded area. There they established connections with the feed wire of the line and used the headlight to attract insects. The resulting catch included about twenty *Actias luna*, several *Telea polyphemus* and *Automeris io* moths, besides a large number of smaller Lepidoptera, in a little over an hour. Several trials of this method gave extremely good results, and suggests the possibility of using electricity at places where moths are most abundant, when trolley lines are properly located for this purpose.

On the 5th, 10th and 23d of June, blister beetles were received from correspondents in Stockbridge and Williamstown which were evidently of the genus *Pomphopaa* and which were kindly identified by Mr. Charles Schaeffer of the Brooklyn Museum as *Pomphopaa sayi* Lec. This insect has never before been received by the Experiment Station, and the data sent with the insects were of such interest as to be worthy of record. The Williamstown correspondent, under date of June 5, writes: "On the mountain ash tree where they were found, there were about a quart." One of the Stockbridge correspondents wrote, June 10: "Yesterday morning on entering my garden I found that these beetles had taken possession of the place. Every flower stock had been eaten down and the iris and roses were

fast being devoured. Lupins seemed to be the favorite and not one was left. The beetles seemed to be drunk with the nectar for they stuck to the flowers and we could easily cut the stock and drop it in a pail of kerosene. We caught hundreds in this way. Later, in the afternoon, they seemed to have taken flight. There was a flight of about 300 on June 12, eating lupin, roses, syringas, iris, etc., eating the flowers and not the foliage. They appeared suddenly, over night. There was no special wind or other climatic conditions noticed. They were exterminated by hand and after a heavy rain at night none appeared next day."

The other Stockbridge correspondent, on June 23, wrote: "Three days ago I found these beetles eating the roses in the garden. They lighted, half a dozen or so, on one rose and devoured it rapidly. They were either so sluggish or so hungry that they were easily caught and the gardener drowned several hundred in an hour. Since then I have seen only a few scattered individuals. They seem tenacious of life, as specimens have lived three days in a box.

During the last ten years it has been of interest to note that the insects named by the New York State Entomologist in any year as attracting attention, were also as a rule, those receiving similar attention in the Connecticut report of that year, and it was usually safe to expect their presence in Massachusetts the following year. It would almost seem as though most of these cases of increase in abundance originated to the west, and reached Massachusetts from that direction. This has sometimes been so marked that the western end of the state would show an unusual abundance of some pest which the following year extended its injuries into the eastern end of the state.

The above is of course, only a generalization, but it has nevertheless occurred so often as to attract some attention.

INJURIOUS INSECTS OF 1911 AT TREESBANK, MANITOBA

By NORMAN CRIDDLE

The season of 1911 had few surprises for the economic Entomologist and the injury done to crops and other vegetation was chiefly due to the continuous, or increased abundance of insects commonly met with the previous year. The most important of these are depicted in the following notes.

Insects Injurious to Grain and Grasses

Hessian Fly, *Mayetiola destructor*.—Infested spring wheat plants were gathered on May 17, being injured chiefly below the ground. The larvæ at this time were small and difficult to detect. On June